## REMARKS

The Office Action dated March 13, 2006 has been received and carefully considered. The above amendments and the following remarks are being submitted as a full and complete response to the Office Action.

All claims formerly pending in the present application have been canceled and replaced by a new set of claims, in which new claims 83 to 94 emphasize features of the invention that were discussed with Examiner Amini in an interview conducted on June 29, 2006. The applicant's counsel thanks the Examiner for his courtesy and interest offered during the interview.

More specifically, new independent claims 83, 88 and 90 emphasize the feature of mapping first and second semitransparent texture images (208a, 208b), respectively, onto polygons (206) making up first and second three-dimensional semitransparent objects (204a, 204b), wherein the second semitransparent object is rendered to lap over the first semitransparent object (that is, the first and second semitransparent objects 204a, 204b are arranged in superposed layers), as illustrated in FIG. 6.

Further, as set forth in claims 83, 88 and 90, the plurality of texture images (208a, 208b), which are mapped to the polygons (206), are each respectively moved (the moving feature shall be discussed in greater detail below) so as to rewrite them into a texture rendering area (34a) of an image memory (34), thereby causing the first semitransparent texture images (208a) to become associated respectively with different polygons from among the first polygons, and causing the second semitransparent

texture images (208b) to become associated respectively with different polygons from among the second polygons. Thereafter, a repeating step is performed so that the texture images are continuously moved and rewritten so as to be repetitively mapped onto different polygons (206) making up the first and second objects (204a, 204b), thus providing a simulated motion feature (e.g., fluid motion such as a stream of water or a flow of smoke) using comparatively simple texture mapping techniques.

Support for the features of claims 83, 88 and 90 can be found in the present specification on page 11, lines 2 to 22, and FIGS. 7A and 7B. Specific support for the claimed repeating step is found on page 18, line 17, to page 22, line 8, as well as in FIG. 14.

Further, new independent claims 85 and 92 are directed to features of the invention illustrated in FIGS. 7A and 7B of the present specification, in particular, wherein the processed image includes at least three semitransparent objects (218, 220, 222) therein, and sequential rendering is performed by selecting one of the objects, mapping semitransparent texture images (208) onto plural polygons (206) that make up the selected object, wherein the texture images (208) are written into a texture rendering area (34a) of an image memory (34). Then, the texture images (208) of each of the at least three semitransparent objects (218, 220, 222) are sequentially moved (again, the moving feature shall be discussed in greater detail below), wherein such sequential moving is accomplished by selecting one of the objects and arbitrarily moving the texture images (208) therein so as to

rewrite them into the texture rendering area (34a), and the sequential rendering and sequential moving steps are repeated. Similarly, this feature enables a simulated fluid motion to be represented by a comparatively simple texture mapping technique, wherein simulated motion is imparted to each of the at least three semitransparent objects (218, 220, 222) in a sequential manner.

Support for the above claimed features is found in the present specification on page 11, line 22, through page 12, line 14, and shown in FIGS. 7A and 7B. Further, support for the repeating step, and the sequential operations on respective objects, is discussed on page 18, line 17, through page 22, line 8, and shown in FIG. 14.

In addition, analogous to the feature already appearing in independent claims 83, 88 and 90, dependent claims 86 and 93 also emphasize the feature that the sequentially rendered semitransparent objects are lapped over each other (that is, the first and second semitransparent objects 218, 220, 222 are arranged in superposed layers), as shown in FIG. 7B. Further support for this feature also appears in the present specification on page 11, line 22, to page 12, line 5.

Finally, new dependent claims 84, 87, 89, 91 and 94 address the feature that, during movement of the texture images, the texture images are moved so as to be associated respectively with different *adjacent* polygons from among the polygons making up the object *in a circulating manner*. This feature of the invention

shall be discussed in greater detail below together with explanation of the claimed moving step.

More specifically, the moving steps (and means) set forth in the pending claims are most easily understood with reference to FIG. 3 of the present specification. The features discussed in relation to FIG. 3 are applicable to all embodiments of the present invention, including those shown in FIG. 6 and FIGS. 7A and 7B discussed above. That is, FIG. 3 illustrates how the texture images (e.g., texture images 208 shown in FIGS. 4A and 4B) are repetitively mapped and moved over the respective polygons (206) that make up the object (204).

As shown in FIG. 3, the object (204) is made up of a plurality of respective polygons (206), the polygons (206) being shown as adjacent four-sided polygons or quadrilaterals. Respective different texture images (208), as shown in FIGS. 4A and 4B, are initially texture mapped onto each of the polygons making up the object. Then, the texture images are moved, by rewriting them in the texture rendering area (34a) of the image memory (34), so as to become associated with different polygons. More specifically, as shown in FIG. 3, the texture images may be moved in a circulatory fashion to become associated with different adjacent polygons. For example, the texture images in group ① are moved, as shown by the left pointing arrows, so that the texture image (5) is shifted to occupy the polygon formerly occupied by texture image (4), the texture image (4) is shifted to occupy the polygon formerly occupied by texture image (3), and the texture image (1) is shifted to occupy the polygon formerly

occupied by texture image (5), and so forth, in a circulating manner. Thus, when the textures are moved, each respective texture ends up being associated with a different adjacent polygon from where it had been previously mapped, and the moved textures are then remapped onto the different polygons.

Importantly, in the present invention, the object (i.e., the multi-polygonal object 204) itself is not moved, but on the contrary, only the texture images (208) in the image memory (34) are moved, and then the moved texture images are mapped onto the plurality of polygons. This differs from known prior art fluid motion rendering techniques, in which a plurality of objects are moved at random, and then textures are mapped onto the moved objects, which complicates the rendering process and increases computational load, in that computationally intense polygon processing must be repeatedly performed. (See, present specification, page 1, last line, through page 2, line 21, for a discussion of this drawback of the prior art.) By contrast, according to the claimed invention, the object (204) and the polygons (206) making up the object are not moved, but remain stationary. Only the texture images (which are simple bitmap images and thus easily manipulated) are moved in the image memory (34), and thus simply mapped onto different fixed polygons making up the object. Therefore, the computational load is decreased, while rendering and display speeds are increased.

Claims 1, 5-7, 11-13, 17-20 and 67-82 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Blinn (U.S. Patent No. 6,184,891) in view of Snyder et al. (U.S. Patent No.

6,326,964). Insofar as these rejections may apply to new claims 83 to 94, the rejections are traversed for the following reasons.

During the interview on June 29, 2006, the primary reference Blinn was discussed at length with the Examiner. Most significantly, in contradistinction to the features recited in all independent claims 83, 85, 88, 90 and 92 discussed above, Blinn does not disclose any improvements or novel techniques directed to texture mapping*, which is the main focus of the present invention. Quite the contrary, texture mapping is mentioned only briefly one time (col. 12, line 17) in the entire specification of Blinn, as a feature which is common in software rendering systems. Blinn, however, does not disclose or suggest any improvements or modifications to known texture mapping techniques, and Blinn certainly does not suggest *moving texture images* to rewrite them into a texture rendering area, thereby causing the texture images to become associated respectively with different polygons from among plural polygons making up a three-dimensional object, as currently claimed.

Rather, Blinn mainly concerns application of fog color values $(R,G,B,\alpha)$ to individual pixels of a screen display, wherein R, G and B represent red, green and blue color values, and $\alpha$ indicates an opacity value applied to the pixel to produce a fog effect. The extent to which an object appears to fade into the fog depends on such a fog factor, and specifically, how much fog exists between the view point and the object. FIG. 2 of

* The process of placing a bitmap image, or texture, on a surface during rendering.

Blinn, which was primarily relied on by the Examiner in the Office Action, does not show or suggest the mapping of texture images onto polygons, but rather is a schematic representation of the color calculations applied to individual screen pixels (not polygons) to produce a fogging effect (see, paragraph bridging columns 2 and 3). Further, there is no mapping of texture images even remotely suggested in FIG. 2. Basically, Blinn is concerned with making corrective calculations, so that the amount of fog color (shown by the scattering of dots 48) is not doubly applied to regions of the pixels, resulting in too much fog color. Therefore, according to Blinn's corrective technique, the correct fog color can be applied to each pixel region 130, as shown in FIG. 3. Fundamentally, however, Blinn is not a texture mapping technique at all, but rather a color compensation technique.

With respect to Snyder et al., while more directly concerned with texture mapping than Blinn, this reference has only been applied with respect to the claimed feature of moving and mapping the texture images to polygons in a circulating manner. However, as the Examiner has recognized and emphasized (page 3, lines 18-19, of the office action), the cited prior art discusses movement of objects (not movement of mapped texture images on a stationary multi-polygonal object as claimed), and the modification of Blinn in view of Snyder et al. does not alter this fact. In other words, neither of the cited references discloses the movement of texture images in a texture rendering area, so as to become associated respectively with different adjacent polygons from among polygons making up an object in a

circulating manner, as currently claimed. Therefore, it is respectfully submitted that Snyder et al. does not make up for the serious deficiencies of Blinn discussed previously, and therefore the claims are allowable over the references whether singly or in combination.

For the foregoing reasons, it is respectfully submitted that the claimed invention is not anticipated and would not have been obvious to a person skilled in the art at the time the present invention was made. Reconsideration and withdrawal of the rejections, and allowance of pending claims 83 to 94, is respectfully requested.

No additional fees are currently due. Notwithstanding, in the event that fees, or deficiencies in fees, are deemed necessary in connection with this or any accompanying communication, such fees may be charged to the Attorney's Deposit Account No. 07-2519.

Respectfully submitted,

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